

Support for Amendment:

Claim 57 is canceled. The applicants reserve the right to pursue canceled claim 57 in a divisional patent application as a result of a restriction requirement.

Claims 1, 4, 6-12, 14, 15, 18, 20, 24, 26, 28, 30, and 32 to address various formality and grammatical issues identified on page 3 of the Office Action. No new matter has been added. Support for the amendments can be found in the original claim set and throughout the specification.

Claim 58 is new and is similar to claim 1 except that the alternative language regarding treating a soil surface has been removed. No new matter has been added. Support for this claim can be found at original claim 1 and throughout the specification, for example at page 5, lines 9-13.

Claims 59-69 are new and incorporate subject matter from the previously presented and/or original claim set. No new matter has been added. Support can be found throughout the specification and in the original claim set.

Entry of the Amendment is requested. Upon entry of the Amendment, claims 1-12, 14, 15, 18, 20, 22, 24, 26, 28, 30, 32 and 58-69 are active in this application.

REMARKS

The Office Action mailed December 10, 2008 includes several formal and prior art based rejections, each of which is discussed in turn.

35 U.S.C. § 112 Claim Rejections:

Claims 1-12, 14, 15, 18, 20, 22, 24, 26, 28, 30 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter in the invention. Claims 1, 4, 6-12, 14, 15, 18, 20, 24, 26, 28, 30, and 32 have been amended to address the Examiner's concerns, as expressed on page 3 of the Office Action. The Examiner is requested to reconsider the rejection in light of the amended claims presented in this Amendment. Withdrawal of the rejection is requested.

35 USC 102(b) and 103(a) Claim Rejections over US Patent 6,029,395 to Morgan.

Claims 1, 7, 8 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Morgan (U.S. Patent 6,029,395). Additionally, claims 5, 14, 15, 20, 22, 24, 28, 30 and 32, all of which ultimately depend from claim 1, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan. These rejections are traversed.

Claim 1 discloses a film or membrane forming mixture for treating at least one of a soil surface or a soil mass, the mixture comprising a basic powder mixture of a water-soluble, dried and ground organic raw material, a thickening agent and a pigment. The basic powder mixture of claim 1 also includes at least one component which has a sufficient antioxidising effect to ensure that the formed film or membrane has an antioxidising effect on the surroundings. Further, the film or membrane is formed on at least one of the soil surface and the soil mass at some distance down in the soil mass when the mixture is either spread either over the soil surface or arranged in the soil mass. Claim 58 is similar to claim 1, but requires that at least a portion of the film or membrane be formed at some distance down into the soil mass.

Morgan discloses a biodegradable mulch mat comprising an air and water permeable, light impermeable, open celled, composite of granules and fibers in a binder matrix prepared from a foam precursor. See Morgan at Abstract. In lines 1 - 8 of column 4 of Morgan, it is disclosed that use of a water soluble binder gives an advantage in that a certain amount of the

binder may leach from the foam as the foam is applied, resulting in a bonding between the mulch mat and top soil. The bonding zone may be from 0.5 to 1 cm thick. See Morgan at column 4, lines 1-4. From lines 31 - 46 in column 6 of Morgan it is disclosed that the foam should be applied onto the top soil with a thickness of 2 - 8 cm in field application, resulting in a dry mat with thickness of about 1 cm. From the examples presented in Morgan it is found that the amount of dry powder (constituting the fibres, granules, and binder) is from about 100 to 1000 g per square meter soil surface. For example, refer to column 6, line 58 to column 7, line 15 of Morgan. An anti-oxidising compound may also be added to the aqueous foam in order to make the mulch mat more resistive towards UV-light. See Morgan at lines 1-5 on column 5.

Claims 1 and 58 are neither anticipated nor obvious over Morgan, as explained below.

First, Morgan does not disclose a film or membrane forming mixture that is comprised of a basic powder mixture, as required by claims 1 and 58. Instead, Morgan discloses a mulch mat that is formed in aqueous foam. See Morgan at column 4, lines 8-9. The claimed invention is a powder mixture which, when dissolved in water or other polar solvents and administered to a soil surface, will penetrate a distance into the soil surface and set into a solid mechanically and chemically protective membrane. The membrane will endure for at least a couple of weeks, but may last an entire growth season or more, depending upon amounts and composition of the powder mixture. The mechanically and chemically protective membrane has a combined effect in that it is mechanically solid, wear resistant, water penetrable, water stabilising (retains moisture), antioxidising, and temperature regulating for the above mentioned period of time. This combined effect provides plants with a protection against oxidants, disadvantageous temperatures, and drought through at least a part of the growth season. This is the primary effect of the claimed invention. The claimed invention should thus not be considered as a fertilizer or mulch composition, it is primarily powder mixture forming a mechanically and chemically protective membrane in the top soil. The membrane has a secondary effect of being biodegradable and acting as a fertilizer, but only after servicing as the primary mechanically and chemically protective membrane.

This aspect of the claimed invention should not be missed. A powder amount of 1 g per square meter soil surface corresponds to a need for only 10 kg of the powder per hectare land, which is at least one order of magnitude (often several orders of magnitude) lower than any comparable prior art. As mentioned previously, Morgan requires fibers in the general amount of

course; the top layer of the soil). Plant damages due to ozone and other oxidants have traditionally been reckoned as an air-borne pollution problem, and not a problem of ozone formation in the soil surface. Thus a skilled person in the art, believing that ozone damage was airborne problem having no relationship to the soil itself, would not have been lead by the cited prior art to arrive at the claimed invention and specifically to the claimed feature of at least one of the compounds having a sufficient antioxidising effect on the surroundings. Thus a skilled person would have no incentive for making an anti-oxidising membrane into the top soil to protect the vulnerable plant roots/young plants, nor would the skilled person read the cited prior art with the aim of finding such a plant root protecting membrane. The closest cited prior art providing a mat with many of the similar properties, Morgan, teaches the opposite, to form a protective mat on-top of the soil. Based on at least the foregoing reasoning, claims 1 and 58 are patentable over Morgan.

Third, Morgan does not disclose or suggest a film or membrane forming mixture wherein at least a portion of the film or membrane is formed at some distance down in the soil mass when the mixture is spread over the soil surface, arranged in the soil mass, or both, as specified in claim 58. Instead, and as stated previously, Morgan discloses a mulch mat having fibers that is disposed on the top surface of the soil. The claimed invention does not use fibres in the powder mixture since the aim of this membrane forming solution is to make the membrane form mainly into the soil, and not on-top of the soil. This seemingly unimportant difference makes it possible to obtain the same effects of fertilizing, erosion protection, temperature regulation etc. as the mat according to Morgan, but with only 1 - 3 g dry matter per square meter soil surface as opposed to about at least 54 g dry matter per square meter in Morgan. This is a difference of 2 to 3 orders of magnitude, and is a clear indication that it should not be considered obvious to a skilled person. For at least this reasoning, claim 58 is patentable over Morgan. Withdrawal of the rejections is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 6,946,496 to Mankiewicz:

Claims 2, 3 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan and Mankiewicz (U.S. Patent 6,946,496). This rejection is traversed.

Morgan has been discussed previously. Mankiewicz discloses an artificial soil including a plurality of foam plastic fragments. See Mankiewicz at Abstract.

at least 54 g per square meter. See Morgan at column 6, lines 58-67. The remarkable effectiveness of the claimed invention is essential since it drives the costs down to a level where it becomes economically viable to employ the invention in a very large scale such as geo-engineering entire landscapes by changing the albedo. See enclosed Exhibit A which is a letter from members of the Congress of the United States. The specific combination of protections provided by this coating has shown impressively good results in various test sites with very different climate conditions in Kuwait, Egypt, Spain, and Norway in enhancing plant growth and in making barren land arable. Further, please note that the powder mixture according to the claimed invention does not include a reinforcing compound, but instead the cover/membrane forming mixture penetrates into and binds particulate material in the soil to give the necessary mechanical strength to the resulting membrane. This is believed to be one reason for the low dosages of dry powder required to make an effective membrane. For at least the aforementioned reasons, claims 1 and 58 are patentable over Morgan. Withdrawal of the rejection is requested.

Second, Morgan does not teach or suggest a basic powder mixture that includes at least one component having a sufficient antioxidising effect to ensure that a formed film or membrane has an antioxidising effect on the surroundings, as stipulated in claims 1 and 58. Instead, Morgan discloses the use of an anti-oxidising compound that may be added to aqueous foam in order to increase the UV-light resistance of the mulch mat itself. See Morgan at lines 1-5 on column 5. As such Morgan makes no suggestion regarding the use of antixodiants in sufficient amounts to produce an antioxidising effect on the surrounding environment. Further, as Morgan only discloses that the binder leaches into the top soil, there is no teaching or suggestion in Morgan that foam containing any antixodiant would penetrate into the area surrounding the mat. See Morgan at column 4, lines 1-8.

Additionally, and as can be seen from line 38 on page 21 to line 26 on page 22 of the specification for this Application, a feature of the disclosed membrane is the ability of the membrane to destroy oxidants in the micro air-layer just above the soil surface (i.e. the surroundings specified in claims 1 and 58). This feature protects the plants from damages caused by formation of ozone in the top soil when illuminated by sun light. Formation of ozone in the top soil is as far as the inventor knows a discovery made by the inventor and represents the unobvious discovery of a new problem. No prior art of the inventor's knowledge teaches the importance of destroying ozone and other oxidisers in the air just above the top soil (including of

Claims 1 and 58 are patentable over Morgan and Mankiewicz because they do not teach the claimed invention. As stated previously, Morgan fails to disclose or suggest the film or membrane forming mixture that is comprised of a basic powder mixture and the basic powder mixture that includes at least one component having an antioxidising effect on the surroundings of claims 1 and 58. In the specific case of claim 58, Morgan also fails to teach or suggest a film or membrane formed by the mixture that is at some distance down in the soil. Additionally, the disclosure of artificial soil including a plurality of foam plastic fragments of Mankiewicz does not address the cited shortcomings of Morgan. As a result, Morgan and Mankiewicz do not teach or suggest the claimed invention. Claims 1 and 58 are therefore patentable over Morgan and Mankiewicz. Withdrawal of the rejection is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 5,441,877 to Chiaffredo et al.:

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan and further in view of Chiaffredo et al. (U.S. Patent 5,441,877).

Morgan has been discussed previously. Chiaffredo et al. disclose a biologically enriched substrate containing organic matter rich in colonies of Cyanophyceae and Bryophytes for rapid creation of natural vegetation on bare terrain. See Chiaffredo et al. at Abstract.

Claims 1 and 58 are patentable over Morgan and Chiaffredo et al. because they do not teach the claimed invention. As stated previously, Morgan fails to disclose or suggest the film or membrane forming mixture that is comprised of a basic powder mixture and the basic powder mixture that includes at least one component having an antioxidising effect on the surroundings of claims 1 and 58. In the specific case of claim 58, Morgan also fails to teach or suggest a film or membrane formed by the mixture that is at some distance down in the soil. Additionally, the disclosure of a biologically enriched substrate containing organic matter rich in colonies of Cyanophyceae and Bryophytes for rapid creation of natural vegetation on bare terrain found in Chiaffredo et al. does not address the cited shortcomings of Morgan. As a result, Morgan and Chiaffredo et al. do not teach or suggest the claimed invention. Claims 1 and 58 are therefore patentable over Morgan and Chiaffredo et al. Withdrawal of the rejection is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 4,797,145 to Wallace et al.:

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan and further in view of Wallace et al. (U.S. Patent 4,797,145).

Morgan has been discussed previously. Wallace et al. disclose a method for improving the physical properties of soil by the application of aqueous mixtures of agricultural polyelectrolytes and polysaccharides to the soil. See Wallace et al. at Abstract.

Claims 1 and 58 are patentable over Morgan and Wallace et al. because they do not teach the claimed invention. As stated previously, Morgan fails to disclose or suggest the film or membrane forming mixture that is comprised of a basic powder mixture and the basic powder mixture that includes at least one component having an antioxidising effect on the surroundings of claims 1 and 58. In the specific case of claim 58, Morgan also fails to teach or suggest a film or membrane formed by the mixture that is at some distance down in the soil. Additionally, the disclosure of disclose a method for improving the physical properties of soil by the application of aqueous mixtures of agricultural polyelectrolytes and polysaccharides to the soil found in Wallace et al. does not address the cited shortcomings of Morgan. As a result, Morgan and Wallace et al. do not teach or suggest the claimed invention. Claims 1 and 58 are therefore patentable over Morgan and Wallace et al. Withdrawal of the rejection is requested.

For at least all of the foregoing reasoning, claims 1 and 58, and all dependent claims are patentable over the cited prior art. Withdrawal of all rejections is requested, as is a Notice of Allowance.



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Respectfully submitted,

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By

A handwritten signature in dark ink, appearing to read "Dennis R. Daley". The signature is written over a horizontal line.

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